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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/826,185

04/15/2004

Steven M. Zuniga

2834C2-303003

9780

26185 7590 11/20/2007

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EXAMINER

CULBERT, ROBERTS P

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/826,185	Applicant(s) ZUNIGA ET AL.	
	Examiner Roberts Culbert	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 and 16-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 9/21/07 have been fully considered but they are not persuasive.

Applicant argues that Maveety and Shendon fail to teach that "the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion" as recited in Claims 1 and 37-39. However, the argument is not persuasive. However, both Maveety and Shendon teach screws filling the apertures relied upon by applicant, which clearly reads on the broadly recited claims. Further, it is noted that applicant's specification does not indicate that the lack of an aperture is a critical feature of the invention, but instead teaches (Page 9, Lines 25-26) that "*Alternately, instead of being adhesively attached, the lower portion can be attached with screws or press-fit to the upper portion.*" Shendon similarly teaches that screw attachment is not critical, but that "*The perimeter ring can also be mounted without screws, such as by use of key slots...*" Thus, Shendon clearly does indicate an additional embodiment where the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion.

Applicant argues that Maveety fails to teach that "*the top surface is configured such that the retaining ring is removable as a unit from the base*" as recited in Claims 17, 29 and 34. The argument is not persuasive because the retaining ring of Maveety et al. is clearly removable "as a unit" from the base, as broadly recited, simply by removing the upper portion and lower portion at approximately the same time or by using any number of cutting or disassembly means including destructive and/or non-destructive means.

Applicant argues that Shendon fails to teach a retaining ring in which a top surface of the upper portion of the retaining ring is fixed to and abutting the base as recited in Claims 17 and 29. The examiner respectfully disagrees. The retaining ring is "fixed to and abutting the base" as illustrated in Figures 3 and 4 of Shendon. Applicant focuses on Figure 4, however, the small gaps shown in this close-up are

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tolerances shown between generally abutting parts, further, the base and ring abut via bladder 170 and spring 172 which reads on the broadly recited claims.

Applicant argues that one of ordinary skill in the art would consider only the retaining ring 162, not the retaining ring assembly 146 to constitute a retaining ring. However, the argument is unsupported.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 17-31 and 34-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17 recites "wherein...the top surface is configured such that the retaining ring is removable as a unit from the base." Similarly Claims 29 and 34 recite the limitation "wherein...the retaining ring is secured to the base such that the retaining ring is removable as a unit from the base". Claims 35 and 36 recite, "the retaining ring is removable without disassembly of the carrier head".

Regarding Claims 17, 29 and 34, It is unclear if any physical limitations are indicated by the broad claim language, since any retaining ring having an upper portion and a lower portion, however configured or secured to the base, would appear to be "removable as a unit", simply by approximately removing the upper portion and lower portion at the same time.

Regarding Claims 35 and 36, the retaining ring is expressly recited to be part of the carrier head, thus it is unclear how it may be removed without disassembly of the carrier head.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5, 7-10 12, 13, 17, 20, 22-25, 27-32 and 34-39 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 5,948,204 to Maveety et al.

Regarding Claim 1, Maveety et al. teach a method of polishing comprising holding a substrate on a substrate mounting surface that is vertically movable relative to a rigid base of a carrier head in a chemical mechanical polishing apparatus; bringing the substrate into contact with a polishing surface; creating relative motion between the polishing surface and the substrate; and maintaining the substrate beneath the substrate mounting surface with a retaining ring that includes a generally annular lower portion having a bottom surface for contacting the polishing surface during polishing, and a generally annular upper portion having a bottom surface joined to the lower portion and a top surface fixed to and abutting the base, and wherein the lower portion is made of a plastic and the upper lower portion is made of a metal which is more rigid than the plastic. Maveety further teaches that the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion

Regarding Claim 17, Maveety et al. teach a method of assembling a retaining ring, comprising: securing a generally annular lower portion made of a plastic and having a bottom surface for contacting a polishing pad during polishing to a bottom surface of a generally annular upper portion made of a metal which is more rigid than the plastic and having a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head, wherein the upper portion is attached to the lower portion and the top surface is configured such that the retaining ring is removable as a unit from the base.

Regarding Claim 29, Maveety et al. teach a method of assembling a carrier head, comprising: securing a top surface of an upper portion of a retaining ring to be affixed to and abut a rigid base of the carrier head, wherein the retaining ring includes a generally annular lower portion made of a plastic and

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having a bottom surface for contacting a polishing pad during polishing, and wherein the upper portion is made of a metal which is more rigid than the plastic and includes a bottom surface joined to the lower portion, and the top surface is configured such that the retaining ring is removable as a unit from the base.

Regarding Claim 39, Maveety et al. teach a method of assembling a retaining ring, comprising: securing a generally annular lower portion made of a plastic and having a bottom surface for contacting a polishing pad during polishing to a bottom surface of a generally annular upper portion made of a metal which is more rigid than the plastic and having a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head, wherein the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion.

Regarding Claim 2, Maveety et al. teach dispensing slurry onto the polishing surface is conventional in the polishing art. (C1 L33-35)

Regarding Claim 3, Maveety et al. teach applying a load from the mounting surface to press the substrate against the polishing surface. (C1, L45-50)

Regarding Claim 5, Maveety et al. teach creating relative motion by rotating the polishing surface. (C1, L30-35)

Regarding Claims 7 and 22, Maveety et al. teach a plastic substantially inert to a chemical mechanical polishing process. (C3, L9-19)

Regarding Claims 8 and 23, Maveety et al. illustrate a lower portion that is thicker than a substrate.

Regarding Claims 9 and 24, Maveety et al. teach the lower portion is about 100-400 mils thick. (C3, L29-32)

Regarding Claims 10 and 25, Maveety et al. teach the plastic is selected from the group consisting of: polyphenylene sulfide, polyethylene terephthalate, polyetheretherketone, and polybutylene terephthalate. (C3, L9-14)

Regarding Claims 12 and 27, Maveety et al. teach the metal is stainless steel.

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Regarding Claims 13 and 28, Maveety et al. teach plastics having an elastic modulus about ten to one hundred times the elastic modulus of the metal.

Regarding Claim 20, Maveety et al. teach attaching the lower portion to the upper portion with screws.

Regarding Claim 30, Maveety et al. teach securing a substrate backing assembly to the rigid base so that a substrate-receiving surface of the substrate backing assembly is vertically movable relative to the rigid base.

Regarding Claim 31, Maveety et al. teach securing the substrate backing assembly to the rigid base includes clamping a flexure in the substrate backing assembly between the rigid base and the retaining ring.

Regarding Claim 32, Maveety et al. teach a substantially flat bottom surface of the lower portion.

Regarding Claim 34, Maveety et al. teach a retaining ring removable as a unit from the base.

Regarding Claims 35 and 36, Maveety et al teach that the retaining ring is removable without disassembly of the carrier head.

Regarding Claims 37-39, Maveety et al teach the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion.

Claims 1-8, 12, 13, 16, 17, 20-23, 27-32 and 34-39 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 747 167 A2 to Shendon et al.

Regarding Claim 1, Shendon et al. teach a method of polishing comprising holding a substrate on a substrate mounting surface that is vertically movable relative to a base rigid base of a carrier head in a chemical mechanical polishing apparatus; bringing the substrate into contact with a polishing surface; creating relative motion between the polishing surface and the substrate; and maintaining the substrate beneath the substrate mounting surface with a retaining ring that includes a generally annular lower portion having a bottom surface for contacting the polishing surface during polishing, and a generally annular upper portion having a bottom surface joined to the lower portion and a top surface fixed to and

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abutting the base, and wherein the lower portion is made of a plastic and the upper lower portion is made of a metal which is more rigid than the plastic.

Regarding Claim 17, Shendon et al. teach a method of assembling a retaining ring, comprising: securing a generally annular lower portion made of a plastic and having a bottom surface for contacting a polishing pad during polishing to a bottom surface of a generally annular upper portion made of a metal which is more rigid than the plastic and having a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head.

Regarding Claim 29, Shendon et al. teach a method of assembling a carrier head, comprising: securing a top surface of an upper portion of a retaining ring to be affixed to and abut a rigid base of the carrier head, wherein the retaining ring includes a generally annular lower portion made of a plastic and having a bottom surface for contacting a polishing pad during polishing, and wherein the upper portion is made of a metal which is more rigid than the plastic and includes a bottom surface joined to the lower portion.

Regarding Claim 2, Shendon et al. teach dispensing slurry onto the polishing surface is conventional in the polishing art. (C1 L22-26)

Regarding Claim 3, Shendon et al. teach applying a load from the mounting surface to press the substrate against the polishing surface.

Regarding Claim 39, Maveety et al. teach a method of assembling a retaining ring, comprising: securing a generally annular lower portion made of a plastic and having a bottom surface for contacting a polishing pad during polishing to a bottom surface of a generally annular upper portion made of a metal which is more rigid than the plastic and having a top surface configured to be mechanically affixed to and abut a rigid base of a carrier head, wherein the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion.

Regarding Claim 4, Shendon et al. teach applying a load includes pressurizing a chamber in the carrier between the substrate mounting surface and the base

Regarding Claim 5, Shendon et al. teach creating relative motion by rotating the polishing surface. (C1, L30-35)

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Regarding Claim 6, Shendon et al. teach creating relative motion by rotating the carrier head.
(C1, L42-47)

Regarding Claims 7 and 22, Shendon et al. teach a plastic (Delrin) substantially inert to a chemical mechanical polishing process.

Regarding Claims 8 and 23, Shendon et al. illustrate a lower portion that is thicker than a substrate.

Regarding Claims 12 and 27, Shendon et al. teach the metal is aluminum. (C10, L35)

Regarding Claims 13 and 28, Shendon et al. teach a plastic (Delrin) having an elastic modulus about ten to one hundred times the elastic modulus of the metal.

Regarding Claim 20, Shendon et al. teach attaching the lower portion to the upper portion with screws. (C10, L29-32)

Regarding Claims 16 and 21, Shendon et al. teach alternatively attaching the lower portion to the upper portion by press fitting. (C11, L17-21)

Regarding Claim 30, Shendon et al. teach securing a substrate backing assembly to the rigid base so that a substrate-receiving surface of the substrate backing assembly is vertically movable relative to the rigid base.

Regarding Claim 31, Shendon et al. teach securing the substrate backing assembly to the rigid base includes clamping a flexure in the substrate backing assembly between the rigid base and the retaining ring.

Regarding Claim 32, Shendon et al. teach a substantially flat bottom surface of the lower portion.

Regarding Claim 34, Shendon et al. teach a retaining ring removable as a unit from the base.

Regarding Claims 35 and 36, Shendon et al teach that the retaining ring is removable without disassembly of the carrier head.

Regarding Claims 37-39, Shendon et al teach the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 9-11, 14, 18 19 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 747 167 A2 to Shendon et al.

Regarding Claims 14, 18 and 19, Shendon et al. does not expressly teach attaching with an adhesive such as an epoxy. However, Shendon et al. teach that the plastic ring may be mounted without screws in order to prevent the heads of the screws from coming into contact with the polishing pad and introducing contaminants. Further, as recognized by one of ordinary skill in the art, an epoxy is a well-known alternative means for attaching a plastic and metal workpiece. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to use an epoxy to attach upper and lower portions in order to prevent the heads of the screws from coming into contact with the polishing pad and introducing contaminants as stated by Shendon et al.

Regarding Claims 10, 11, 25 and 26, Shendon et al. does not expressly teach the plastic is polyphenylene sulfide. However, Shendon et al teach that Delrin or similar plastic material may be used. Polyphenylene sulfide is well known in the art to have similar material properties such as hardness, elasticity, wear and chemical resistance to Delrin. Thus, it would have been obvious to one of ordinary skill in the art to use the similar plastics to Delrin as a matter of substituting equivalent plastic materials.

Regarding Claims 9 and 24, Shendon et al. does not expressly teach the lower portion is about 100-400 mils thick. However, it has been held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984)

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Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 747 167 A2 to Shendon et al. in view of 5,944,593 to Chiu et al.

Regarding Claim 33, Shendon et al. teach the method of the invention substantially as claimed, but fail to teach transporting slurry through channels in the bottom surface of the lower portion. Chiu et al. teach transporting slurry through channels in the bottom surface of the lower portion of a retaining ring. It would have been obvious to one of ordinary skill in the art at the time of invention to use channels in the bottom surface of the lower portion of Shendon et al. in order to provide uniform slurry distribution as taught by Chiu et al.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,948,204 to Maveety et al. in view of 5,944,593 to Chiu et al.

Regarding Claim 33, Maveety et al. teach the method of the invention substantially as claimed, but fail to teach transporting slurry through channels in the bottom surface of the lower portion. Chiu et al. teach transporting slurry through channels in the bottom surface of the lower portion of a retaining ring. It would have been obvious to one of ordinary skill in the art at the time of invention to use channels in the bottom surface of the lower portion of Shendon et al. in order to provide uniform slurry distribution as taught by Chiu et al.

Claims 11 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,948,204 to Maveety et al.

Maveety et al. does not expressly teach the plastic is polyphenylene sulfide. However, Maveety teaches the plastic may preferably be a soft material having a Rockwell Hardness value between 90-150. Maveety further teaches that other materials having the desirable properties may be substituted. Thus one of ordinary skill in the art would have found it obvious to use other materials having the recited properties. Note that Polyphenylene sulfide is well known in the materials art to have a suitable Rockwell hardness value, elasticity, wear and chemical resistance.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A handwritten signature in black ink, appearing to be 'R. Culbert', written in a cursive style.

R. Culbert
Examiner
Art Unit 1763